

REMARKS

The claims are directed to a process for controllably providing photodynamic cardiac ablation therapy and devices suitable for practicing such processes.

35 U.S.C. § 102(b) -- Motamedi et al

Claims 1, 2, 8, 11, 12, and 19 stand rejected under 35 U.S.C. 102(b) as anticipated by U.S. Patent 6,143,019, to Motamedi et al. In support of the rejection, the Examiner notes that:

“Motamedi et al discloses a device and method for treating cardiac tissue using photodynamic therapy (Col. 6, lines 3-4). The fiber optic tip is applied external to the heart through the endocardium (Col. 3, line 4). It is inherent that the light activated substances must be introduced into the tissue in some manner.”

Motamedi et al describes a procedure in which, as an alternative, photodynamic therapy is used in conjunction typically with a laser to ablate cardiac tissue. Apparently central to the disclosed technology is the concept of using a diffuser on the laser when ablating so not to perforate the myocardium (see, for instance, the Abstract, Fig. 4, and Example 2). This light diffuser is for the purpose of scattering light widely throughout the cardiac tissue rather than for producing a specific pattern.

Independent claim 1 requires that the photodynamic therapy light source have a predetermined pattern so to produce that predetermined pattern in the cardiac tissue. Motamedi et al does not appear to desire a corresponding pattern but instead diffuses the administered light in a broad way.

Depending claims 2 and 8 are allowable for at least the same reason.

Independent claim 11 has been amended to include the limitation of claim 15. Claim 15 was said to be otherwise allowable. dependent claims 12 and 19 are allowable for the same reasons.

Allowance of claims 1, 2, 8, 11, 12, and 19 is appropriate.

35 U.S.C. § 102(b) -- Chen et al

Claims 22, 23, and 25 stand rejected under 35 U.S.C. 102(b) as anticipated by U.S. Patent 5,800,478 to Chen et al. In support of the rejection, the Examiner notes that:

“Chen et al discloses a flexible probe that is generally linear with light emitting diodes along the axis (Fig. 1).”

Chen et al discloses a flexible device used for PDF therapy having light sources situated inside the device. Figure 1 of Chen et al shows a generally linear placement of the light emitting diodes used as light sources. The light sources are said, however, to be “in a clear (light transparent) biocompatible polymer envelope (106)”. See col. 8, line 62 et seq. These devices are used to spread light as far as is possible in the selected body site. There is no apparent need or desire to situate the light in a specific area.

Claim 22 requires that substantially all of the light emanating from the device come out of the linear light emitting region. Chen et al sprays the emitted light as wide as is possible.

Withdrawal of the rejection is requested.

35 U.S.C. § 102(e) -- Chen et al

Claims 22-24 stand rejected under 35 U.S.C.102(e) as anticipated by U.S. Patent 5,957,960 to Chen et al. In support of the rejection, the Examiner notes that:

“Chen et al discloses a linear light array with multiple light emitting diodes and lenses (Col. 3, line 28) on a panel that can conform to an area to be treated (Fig. 5). The preamble phrase “device for providing light to a cardiac tissue” is intended to use and is given limited patentable weight.”

Similarly, Chen et al ‘960 selects for a PDT treatment device, lenses to be placed before the light sources, lenses of such a shape that the light is dispersed in a wide variety of directions.

The light sources do not appear to be situated in “a linear light emitting region corresponding to said axis” as required by claim 22.

Withdrawal of the rejection is requested.

35 U.S.C. § 103 -- Motamedi et al.

Claims 3, 4, 13, and 14 are rejected under 35 U.S.C. 103(a) as unpatentable over U.S. Patent 6,143,019 to Motamedi et al. In support of the rejection, the Examiner notes that:

“Whether the photosensitizer is introduced locally or systematically would have been obvious to the skilled artisan.”

The patentability of the independent claims from which each of these claims depend has been discussed above. These claims are patentable for the reasons discussed there.

Withdrawal of the rejection is requested.

ALLOWABLE SUBJECT MATTER

The Examiner notes in objecting to claims 5-7, 9, 10, 15-18, and 20-21 that those claims contain patentable subject matter. Applicant appreciates such acknowledgement and urges that the remaining claims are also patentable for the reasons mentioned elsewhere.

CONCLUSION

Applicant has responded to each matter of substance raised in the Office Action. Accordingly, reconsideration and allowance of the claims are respectfully requested. If a telephone conversation would expedite the prosecution of this application, the Examiner is urged and invited to telephone the undersigned at the number given below.

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By:

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

Claims 15 and 23 have been cancelled without prejudice to their later renewal.

Claims 1, 11, 16-19, and 22 have been amended as follows:

1. (Amended) A method for producing lesions having predetermined lesion patterns in cardiac tissue comprising the step of subjecting a cardiac tissue containing a photodynamic drug to a light source arranged in a predetermined pattern to form a lesion corresponding to that predetermined pattern.

11. (Amended) A method for the heat-free treatment of a selected cardiac tissue comprising the step of subjecting said cardiac tissue containing a photodynamic drug to a light source to form a lesion in a predetermined pattern on said cardiac tissue.

15. (cancelled)

16. (Amended) The method of claim 11 [claim 15] wherein said predetermined pattern encircles an ectopic arrhythmic focus in said cardiac tissue.

17. (Amended) The method of claim 11 [claim 15] wherein said predetermined pattern encircles the pulmonary vein bed in the left atrium of a patient having said cardiac tissue.

18. (Amended) The method of claim 11 [claim 15] wherein said predetermined pattern encircles at least one of superior pulmonary veins in the left atrium of a patient having said cardiac tissue.

19. (Amended) The method of claim 11 [claim 15] wherein said predetermined pattern is exterior to a heart containing said cardiac tissue.

22. (Amended) A light delivery device for providing light to a cardiac tissue comprising a generally linear member having a distal region with an axis, said distal region having a substantially clear and linear light emitting region corresponding to said axis, said light emitting region being conformable to a curved cardiac tissue and emitting substantially all light emanating from the device.

23. (cancelled)